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EXAMINER

JAMAL, ALEXANDER

ART UNIT

PAPER NUMBER

2614

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/621,577	<b>Applicant(s)</b> HOSHUYAMA, OSAMU	
	<b>Examiner</b> ALEXANDER JAMAL	<b>Art Unit</b> 2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 March 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-82 is/are pending in the application.
- 4a) Of the above claim(s) 3, 13-29, 32 and 42-82 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-12, 30, 31, 33-41 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. The examiner notes that no amendments have been made only arguments submitted.
2. The examiner notes additional prior art patent to Belt et al. (US 20030031315 A1), which discloses a non-linear echo suppressor (operating via FFT in the frequency domain) that uses the residual and echo estimate signals to further reduce residual echoes from an already echo cancelled signal.

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:  
  
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
2. **Claims 1,22,30** (and all depending claims) rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per **claims 1,30, (and all depending claims)**, the claims recite a spectral shaper stage that estimates an acoustic echo component. It is not clear how this echo component would be any different that the echo estimate being input into the device. There would be no need to re-estimate the echo when it has already been estimated by the echo canceller stage.

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As per **claim 30 (and all depending claims)**, in step D, it is not clear where the 'receiving' is being performed in the claimed device. The step appears to be combining steps performed by the echo cancelling stage and the spectral shaper stage and is not clear.

For the purpose of examination, the examiner assumes the applicant amends/clarifies the claims such that they are clearly enabled by the submitted drawings Figs. 2,3.

### **Claim Rejections - 35 USC § 103**

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 1-2, 5, 30-31 and 34** are rejected under 35 U.S.C. 103(a) as being unpatentable over Christenson et al [US 6,510,224 B1].

Regarding claim 1, Christenson et al teach a speech communication apparatus, as shown in Fig. 3, comprising:

a signal output transducer (i.e. loudspeaker 109) for receiving a distant signal (112) from a far-end talker and producing acoustic energy of the distant signal [Fig. 3];

a signal input transducer (microphone 105) for producing a near-end signal which may contain a component representing a speech activity of a near-end talker or an acoustic echo component, or both, wherein the acoustic echo component occurs as a result of the distant signal being transmitted through an acoustic echo path from the signal output transducer to the signal input transducer [Fig. 3];

an echo canceller adaptive filter (101) for producing an echo replica  $y(n)$  (102) from the distant signal (112) and a residual echo  $e(n)$  representing a difference between the near-end signal and the echo replica [Fig. 3]; and

a spectral shaper (309) for receiving both of the near-end signal and the residual echo as a set of first input signals [Fig. 3], receiving the echo replica as a second input signal, the acoustic echo

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component by modifying the second input signal, and shaping spectrum of the first input signal with the estimated acoustic echo component. [Fig. 3; col. 8, line 25 to col. 10, line 41].

Further, since Christenson et al teach using both of the near-end signal and the residual echo as a set of first input signals to the spectrum shaper (309) [Fig. 3; col. 9, lines 17-45], it would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to use one of the near-end signal and the residual echo as a first input signal to the spectrum shaper (309), as claimed, as a matter of design choice.

**Claim 30** is essentially similar to claim 1 and is rejected for the reasons stated above.

Regarding **claim 2**, Christenson et al teach the speech communication apparatus, wherein the spectral shaper (309) estimates the acoustic echo component for each of a plurality of subband frequencies of audio spectrum [col. 7, line 46 to col. 8, line 9].

**Claim 31** is essentially similar to claim 1 and is rejected for the reasons stated above.

4. **Claims 5 and 34** are rejected under 35 U.S.C. 103(a) as being unpatentable over Christenson et al as applied to claims 1 and 30 above, and further in view of Oh [US 5,937,060].

Regarding **claim 5**, although Christenson et al disclose using a plurality of subband frequencies of audio spectrum [col. 7, line 46 to col. 8, line 9; col. 9, lines 21-45, col. 10, lines 16-], they do not teach expressly using a synthesis filter.

Oh teaches using analysis filters (712, 722) to divide input signals into a set of subband signals, and a synthesis filter (734) combine the subband signals [Fig. 7; col. 7, lines 16-31].

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teachings of Oh with Christenson et al in order to effectively suppress noise in a residual echo signal [Oh; col. 9, lines 18-24].

**Claim 34** is essentially similar to claim 5 and is rejected for the reasons stated above.

### ***Response to Arguments***

1. Applicant's arguments have been fully considered but they are not persuasive.

As per applicant's arguments that the cited reference Christensson does not disclose the claimed elements of the spectral shaper outputting an echo estimate, the examiner notes the 112 rejection above. Christensson discloses both the echo estimate and error (residual echo signal) being fed into the spectral shaper 309

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(Fig. 3). Applicant argues that the prior art does not disclose the spectral shaper determining the acoustic echo component, however it is not clear in the submitted claims, specification or applicant's argument how to discern from what is estimated by the spectral shaping stage and what is estimated by the echo cancelling stage. Appropriate correction/clarification is requested. Applicant states that the claims (1,22,30) do not recite a spectral shaper, when they clearly do.

As per applicant's arguments that the claims do not recite an 'echo estimate', the examiner notes that applicant's claims clearly recite an 'estimated acoustic echo component', as well as an echo replica.

As per applicant's arguments that it is clear that a 'spectral shaper' receives an 'echo replica' and processes it to produce an estimated echo component, the examiner maintains that it is not clear what this 'estimated echo component' comprises or how it is any different than what is estimated by the traditional echo canceller stage. Applicant argues that the spectral shaper modifies the echo replica to produce the estimated echo component. The examiner maintains that it is not clear exactly what applicant's claimed spectral shaper is doing. One of skill in the art would realize that the echo replica produced by the echo canceller is an echo estimate. It is not clear how this echo estimate (echo replica) would further be modified to produce an echo estimate (estimated echo component). Even moreso, it is not clear how the claimed device would function when the spectral shaper stage receives the input directly from the microphone (near-end signal),

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instead of from the summing stage (residual echo) of the echo canceller.

Applicant still has not disclosed exactly how the spectral shaper functions to determine a non-linear echo component based off the residual echo and the echo replica.

As per applicant's comments that even if the linear echo canceller makes a mistake, the residual echo can be corrected by the spectral shaper. It is not clear how the spectral shaper will function to perform this action when it's functions and inputs comprise the echo replica, which is directly dependent upon the linear echo canceller performing correctly.

Applicant is not using the term spectral shaper in a well known manner, and it is not clear exactly and specifically what functions this shaper is performing. How specifically does it determine non-linear echo from only the residual echo and the echo replica ? How specifically does it correct for mistakes by the linear echo canceller ?

As per applicant's arguments that step D of claim 30 is clearly recited, the examiner disagrees and maintains that it is not clear where the claimed signals are received from and what they are received by.

As per applicant's arguments that Christensson does not disclose the 'spectral shaper' creating an estimated echo component, the examiner disagrees. The examiner is giving a reasonably broad reading to the term 'spectral shaper' and the echo estimate. The examiner again notes the 112 rejections to applicant's

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claimed spectral shaper, in that it is not clearly defined by applicant's specification. The examiner is providing a reasonable reading of applicant's claimed elements. The examiner requests applicant to give a thorough and detail explanation of exactly what defines the claimed 'spectral shaper' (as enabled by the specification) and how it is functioning as claimed. How does the claimed 'spectral shaper' determine non-linear echoes based only on the residual echo signal and the echo replica (estimated from the linear echo cancelling stage).

2. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.



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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Jamal whose telephone number is 571-272-7498, and whose email address is alexander.jamal@uspto.gov

The examiner can usually be reached on M-F 8AM-5PM.

If attempts to reach the examiner by telephone or email are unsuccessful, the examiner's supervisor, Curtis A Kuntz can be reached on 571-272-7499.

The fax phone numbers for the organization where this application or proceeding is assigned are **571-273-8300** for regular communications and **571-273-8300** for After Final communications.

/Alexander Jamal/

Primary Examiner, Art Unit 2614

Examiner Alexander Jamal

June 8, 2009